

removing said second hard mask layer; and
etching said organic polymer film using said patterned first hard mask layer as a mask, wherein at least a part of said first hard mask layer is retained as a dielectric layer.

2. (Amended) The method as recited in Claim 1, wherein said organic polymer film comprises an organic polymer having at least one phenyl group.

3. (Amended) The method as recited in Claim 2, wherein said organic polymer film is selected from the group consisting of benzocyclobutarenes, poly arylene ether, aromatic hydrocarbon, and polyimides.

4. (Amended) The method as recited in Claim 1, wherein the fluorinating step is performed in an ambient comprising fluorine without substantially changing the thickness of said organic polymer layer.

5. (Amended) The method as recited in Claim 4, wherein said fluorine is generated from a source selected from the group consisting of NF_3 , SF_6 , ClF_3 , F_2 , XeF_2 , and C_xF_y , with x and y being positive whole numbers greater than zero.

6. (Amended) The method as recited in Claim 1, wherein said second hard mask layer is selected from the group consisting of oxides, nitrides and oxynitrides.

7. (Amended) A method for patterning an organic polymer film for an interconnect structure in an integrated circuit, said method comprising:

defining at least one first region and at least one second region in an organic polymer film formed on a substrate, said first region being uncovered and said second region being covered with a layer forming a diffusion barrier for fluorine;

exposing said first and said second region to an ambient comprising fluorine resulting in the fluorination of at least a part of said first region, thereby forming a fluorinated part;

removing said layer; and

selectively removing at least a part of said second region by etching, using said first region as a mask, wherein at least a part of said fluorinated part is retained as a dielectric layer.

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8. (Amended) The method as recited in Claim 7, wherein said organic polymer film comprises an organic polymer having at least one phenyl group.

9. (Amended) The method as recited in Claim 8, wherein said organic polymer is selected from the group consisting of benzocyclobutenes, poly arylene ether, aromatic hydrocarbon, and polyimides.

10. (Amended) The method as recited in Claim 7, wherein said layer forming a diffusion barrier for fluorine is selected from the group consisting of resists, oxides, nitrides and oxynitrides.

Please add new Claims 11-14 as follows:

11. (New) An integrated circuit comprising an interconnect structure, said interconnect structure comprising a dielectric layer, said dielectric layer comprising at least a portion of a hard mask layer, the hard mask layer comprising a patterned organic polymer film wherein a portion of the patterned organic polymer film is fluorinated.

12. (New) The integrated circuit as recited in Claim 11, wherein the patterned organic polymer film is a patterned low-K organic polymer film.

13. (New) The integrated circuit as recited in Claim 11, wherein the patterned organic polymer film comprises a surface and an interior, wherein the surface comprises a fluorinated portion and the interior comprises a non-fluorinated portion.

14. (New) The integrated circuit as recited in Claim 13, wherein a K value of the fluorinated portion is less than a K value of the non-fluorinated portion.